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## EUROPEAN PATENT APPLICATION

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### (54) Multiple-use not-woven fabric having anti-static properties

(57) The present invention relates to a multiple-use not-woven fabric having anti-static properties, which comprises a not-woven fabric material supporting layer

on at least a side of which are at least provided graphite regions.

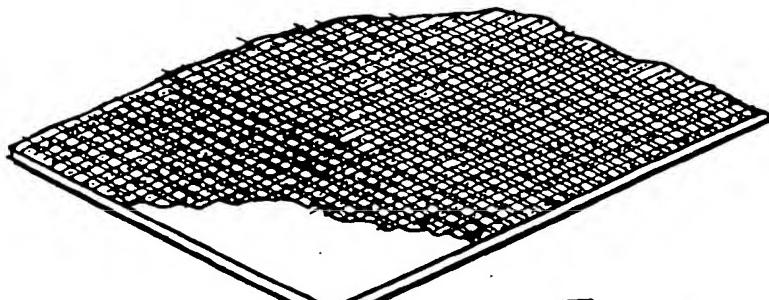


FIG. 1

**Description****BACKGROUND OF THE INVENTION**

The present invention relates to a multiple-use not-woven fabric having anti-static properties.

As is known, in several fields, such as, for example, for making disposable cloth articles for an industrial use, such as jackets and trousers, not-woven fabric materials are used which, however, have inherent highly static properties.

This will generate electrostatic charges on the not-woven fabric material and, during the use, the environmental electrostatic charges will accumulate on the not-woven fabric, with a lot of consequent drawbacks.

**SUMMARY OF THE INVENTION**

Accordingly, the aim of the present invention is to overcome the above mentioned drawbacks, by providing a multiple-use not-woven fabric material having high anti-static properties and adapted to prevent electrostatic charges from being held on the not-woven fabric material, thereby allowing to easily make articles of manufacture such as disposable protective cloth articles for industrial uses, such as jackets and trousers, which are particularly advantageous from an operating standpoint.

Within the scope of the above mentioned aim, a main object of the present invention is to provide an anti-static not-woven fabric material which can be made by very simple processing methods, and, in particular, without changing the typical not-woven fabric material making methods.

Another object of the present invention is to provide such a not-woven fabric material which, owing to its specific making features, is very reliable and safe in operation.

Another object of the present invention is to provide such a not-woven fabric material which can be made by using easily commercially available elements and materials and which, moreover, is very competitive from a mere economic standpoint.

According to one aspect of the present invention, the above mentioned aim and objects, as well as yet other objects, which will become more apparent hereinafter, are achieved by a not-woven fabric material having anti-static properties, characterized in that said not-woven fabric material comprises a not-woven fabric supporting layer on at least a surface of which at least graphite regions are provided.

**BRIEF DESCRIPTION OF THE DRAWINGS**

These and other features of the not-woven fabric material according to the present invention will become more apparent hereinafter from the following detailed disclosure made with reference to the figures of the

accompanying drawing, where:

Figure 1 shows a not-woven fabric material on which is printed a grid-like graphite layer; and

Figure 2 shows a second embodiment of a not-woven fabric material, in which the graphite grids are shown in black and have a net-like construction, which can anyhow have any desired geometric configuration.

**DESCRIPTION OF THE PREFERRED EMBODIMENT**

Further characteristics and advantages of the present invention will become more apparent from the following detailed disclosure of a multiple-use not-woven fabric material, provided with anti-static properties, and specifically provided for making disposable industrial use jackets and trousers.

The not-woven fabric material according to the present invention, in particular, is made of a not-woven fabric material supporting layer, obtained by any suitable methods, and having the main feature of being provided, on at least a surface thereof, with a plurality of graphite regions.

The graphite regions, in particular, are made by a printing method, in which a graphite based ink is used comprising a commercially available product, known with the trade name of Graphite 33, in a rate by weight of 40%, to which ethyl acetate has been added in an amount of 60%.

During the printing operation, the printing ink is applied in an amount from 0.010 to 0.030 liters/m<sup>2</sup>, thereby providing an ink layer which can be either a continuous layer, to provide a solid bottom, or it being constituted by any crossed line net-construction, such as, for example, including a plurality of bar elements and the like, substantially coating the overall surface of a face or surface, thereby providing the required anti-static properties owing to the provision of the electrically conductive layer provided by the graphite material.

From the above disclosure it should be apparent that the invention fully achieves the intended aim and objects.

In particular, the fact is to be pointed out that a not-woven fabric material has been provided which has very high anti-static properties and can be used in multiple uses, in which the environmental electrostatic charges can not build-in or accumulate on the fabric, as the latter is used, because of the provision of a conductive layer discharging the electric charges, thereby preventing them from being held on the fabric material.

Another important aspect to be pointed out is that the electrically conductive layer, provided by the graphite layer, can be made by printing an ink, thereby the surface layer can be made in a very quick and economically advantageous manner.

The invention, as disclosed, is susceptible to sev-

eral modifications and variations, all of which will come within the inventive idea scope.

Moreover, all the details can be replaced by other technically equivalent elements.

In practicing the invention, the used materials, provided that they are compatible to the intended use, as well as the contingent size and shapes, can be any, depending on requirements.

**Claims**

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1. A not-woven fabric material having anti-static properties, characterized in that said not-woven fabric material comprises a not-woven fabric supporting layer on at least a surface of which at least graphite regions are provided. 15
2. A not-woven fabric material having anti-static properties, according to Claim 1, characterized in that said graphite regions are made by printing. 20
3. A not-woven fabric material having anti-static properties, according to Claims 1 and 2, characterized in that said graphite regions are made by printing a graphite based ink. 25
4. A not-woven fabric material having anti-static properties, according to one or more of the preceding claims, characterized in that said graphite based ink comprises Graphite 33 in a rate of 40%, mixed 30 with 60% ethyl acetate.
5. A not-woven fabric material having anti-static properties, according to one or more of the preceding claims, characterized in that said graphite regions are made by using an amount of ink from 0.01 to 35 0.03 liters/m<sup>2</sup>.
6. A not-woven fabric material having anti-static properties, according to one or more of the preceding claims, characterized in that said ink provides on 40 said at least a surface of said not-woven fabric material, a solid bottom or primer coating.
7. A not-woven fabric material having anti-static properties, according to one or more of the preceding claims, characterized in that said graphite regions have a net-like pattern construction. 45
8. A not-woven fabric material having anti-static properties, according to one or more of the preceding claims, and as substantially disclosed and illustrated for the intended aim and objects. 50

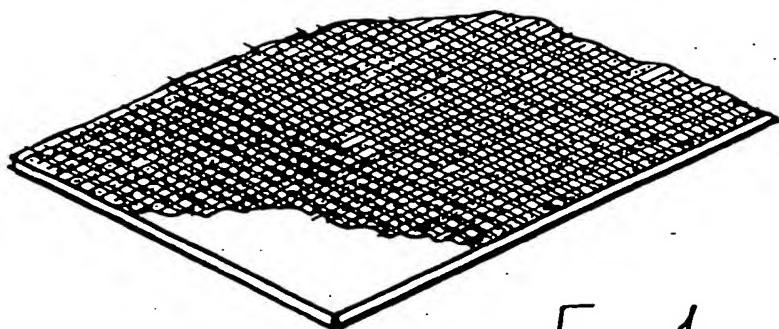


FIG. 1

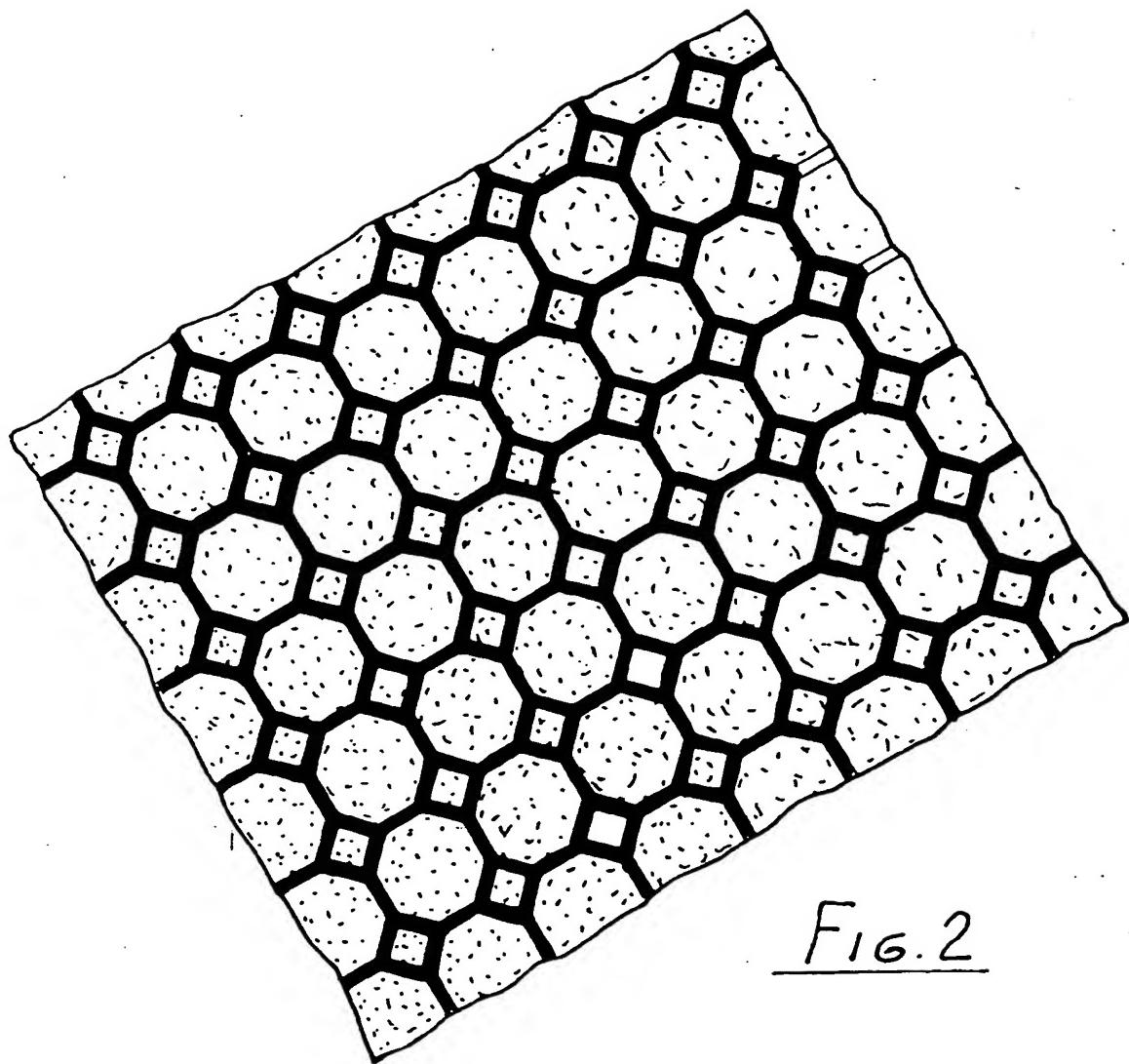


FIG. 2

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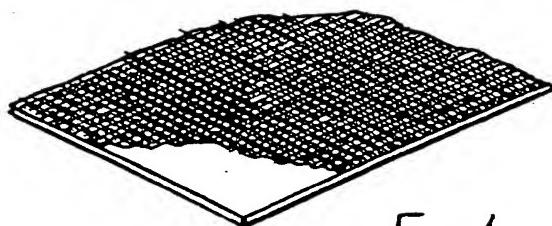


Fig. 1



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## EUROPEAN SEARCH REPORT

Application Number

EP 97 83 0267

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int.Cl.)						
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim							
X	US 5 223 327 A (BIHY LOTHAR ET AL) 29 June 1993 (1993-06-29) * column 3, line 23 - column 5, line 53 *	1-3	D04H1/42 B41M3/00 D06M11/74 D06M23/16 D06P1/00						
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TECHNICAL FIELDS SEARCHED (Int.Cl.)									
D04H									
<p>The present search report has been drawn up for all claims</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">Place of search</td> <td style="width: 33%;">Date of completion of the search</td> <td style="width: 34%;">Examiner</td> </tr> <tr> <td>THE HAGUE</td> <td>21 August 2000</td> <td>V Beurden-Hopkins, S</td> </tr> </table>				Place of search	Date of completion of the search	Examiner	THE HAGUE	21 August 2000	V Beurden-Hopkins, S
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THE HAGUE	21 August 2000	V Beurden-Hopkins, S							
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document							
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document									

**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 97 83 0267

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
The members are as contained in the European Patent Office EDP file on  
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21-08-2000

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